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GARDEN ISSUE

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State Teachers College, Farmville, Virginia. ☐ RENEWAL

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THE AMERICAN BIOLOGY TEACHER

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* Appointed to complete unexpired term of Paul B. Mann, deceased October 22, 1943.

The American Biology Teacher

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Victory Gardens in 1944

How Teachers May Help

H. W. HOCHBAUM
Chairman, Victory Garden Committee, United States Department of Agriculture, Washington, D. C.

The Victory Garden program of 1943 was a phenomenal success. The appeal made by the Secretary of Agriculture and other responsible leaders for more food from home gardens met with a tremendous patriotic response. The country over, the landscape was dotted with Victory Gardens—on farms, in towns and suburbs, in city backyard and community gardens. At least, 20 million gardens were planted, and despite the fact that so many of our gardeners were unskilled and untried, an enormous amount of food was raised—some 8 million tons. This is all the more noteworthy because of the raw, poor soil and the newly turned, rubbish-filled vacant lots which so often were all the gardeners had to work with. Also the cold wet spring or the drought, and bugs and diseases plagued so many. Our 1943 Victory Garden army did a swell job and has earned the gratitude of the nation for helping to meet our food requirements.

Now the food needs for 1944 will be greater than for the year just closing. The President in his recent message to the Congress said: "In the last war, we fed four million men in uniform, largely in the United States and France. In this war, by the end of 1943, we will have almost 11 million men in uniform and they will be stationed all over the world."

"As our army grows, as more men are sent overseas, larger food reserves will have to be accumulated and civilian belts will have to be tightened. Furthermore, our armed forces require more of the so-called 'protective' foods, such as meat, fats and oils, milk and canned goods—foods which are, therefore, bound to run short for the increased civilian demands."

"The amount of food to Lend Lease is gradually increasing. In 1941, it was two per cent of our food production; in 1942 approximately six per cent. This year, because of increasing Russian

shortages and other needs, it will probably reach ten per cent."

So, good as the job of producing food was, our Victory gardeners will need to do even better in 1944. We shall need more Victory Gardens and the War Food Administration and the Department of Agriculture raised the goal from 18 million gardens in 1943 to 22 million for 1944. We shall need larger gardens in many instances. And all gardeners can by better planning and better care increase the production of their gardens very much, especially if the gardens are kept producing all summer and late into the fall.

Now a great deal of the success of our Victory gardeners is due to the wonderful help thousands of volunteer unpaid leaders gave all over the country. They found suitable grounds, held garden meetings and schools, showed beginners what to do, made information available, sponsored garden demonstrations and shows, and in many other ways worked so hard to make the movement succeed. Numbered in this army of volunteers were many, many school and college teachers. One of the best community gardens on the West Coast was made so largely by the effort of a teacher in a Junior College.

We shall need many more such volunteers in 1944 to make the larger program succeed as it should. The school or college teacher can be of inestimable help. These are some of the things which need to be done and in which he can lead:

1. To organize a small local garden committee to sponsor and guide the local community garden effort. This committee should be composed of workers who know how to do.

2. Survey the local garden opportunities, find suitable ground, especially vacant property for community gardens for urban people who may not have suitable ground or sufficient space in the backyard.

3. Recruit old and new gardeners for the 1944 season, arrange for plowing, preparation, water, with local park boards or municipal authorities.

4. Obtain sponsorship and support of local press, trade and civic associations and clubs.

5. Hold garden meetings and schools with the help of the agricultural extension service agents.

6. Obtain help of latter in planning gardens, and in furnishing bulletins and circulars on gardening and home food preservation.

7. Give demonstrations in preparing soil, fertilizing, seeding, planting, spraying and dusting, and general care of the garden.

8. Instruct in harvesting vegetables at best time, and in home food canning, drying, brining and storing.

Below are some of the elements that will make for more successful gardens and a higher production of food. These should be brought to the attention of all Victory gardeners, and all interested in the success of the movement.

1. Use every convenient vacant area that has fairly good soil. Gasoline will be at a premium, and the nearer the garden is to the home the better. But the need for food is great, and distance, if not too far, should not stop the earnest Victory gardener.

2. For health's sake, emphasis should be placed on growing green and leafy vegetables, yellow vegetables and tomatoes. Our gardens should produce far more summer and fall greens, viz.: New Zealand spinach, lettuce, broccoli, turnip greens, collards, kale, Chinese cabbage, cabbage, spinach, vegetable soybeans, as well as carrots, turnips, beets, salsify, and other root crops to store for winter use.

3. Fertilizer will not make up for poor soil preparation. Early and thorough preparation of garden soil is a must. Sod land particularly should be turned in fall.

4. Many, many gardeners still sow too thickly and do not thin.

5. Many plant too much of one kind at

one time with consequent waste, as for example, 25 feet of radishes or lettuce.

6. Gardens should be large enough to supply the family's needs for summer and fall use fresh, for canning some of the winter's supply, and to provide cabbage and root crops for winter storage. A garden of only 500 square feet, while better than nothing, is small. Three or four times that size should be the goal for city gardens, and a half acre or more for farm gardens.

7. Sweet corn, cucumbers, squash, sweet potatoes, potatoes and peas take up a lot of garden space for the yield they give, and it would be well not to plant these in gardens smaller than 1500–1800 square feet.

8. Suburban homesteads and farms should plant far more fruit for home consumption, both fresh and preserved.

9. Garden yields can be increased very much if bugs, diseases, weeds are gotten rid of before they get a good start.

10. Yields in our Victory gardens can be increased where water is available for occasional soaking of the soil. Garden leaders should make this a major item in community gardens.

In these brief notes, I have tried to cover the need for 1944. The field is a big and a most important one. The help of our school and college teachers is most valuable and much appreciated. We hope many more of them will serve.

Children's Gardens in Chicago

FRED G. HEUCHLING
Director Public Information, Chicago Park District

Gardening is fun. It is a practical way of teaching many fundamental scientific lessons. Gardening for food is essentially patriotic these days, too. So there is every reason why victory gardening should be of interest to teachers, and especially to science teachers.

Chicago's schools do not have facilities for teaching practical gardening on the grade school level. Chicago's parks have the physical facilities but lack the staff. Depending solely upon volunteer leadership from the communities, a victory garden project was launched in the season of 1943 that resulted in 14,065 grammar school boys and girls each growing a separate victory garden plot on park property.

The Park District undertook this project for various reasons, probably the least of which was pedagogical in nature. Nevertheless, most of these thousands of novice gardeners learned how vitamin-rich foods are produced in the soil; they experienced all the thrill of pulling one's first radish from the ground; they brought home armloads of freshly harvested vegetables, including some kinds that the family had never before eaten. Were it possible to establish an effective program to tap the resources of the public schools to augment purely volunteer citizen leadership, then this project could be expanded many fold and extend its benefits into the family of every school child in our city. But all that is getting ahead of the story.

On January 12, 1943, the writer made a report to President R. J. Dunham of the Chicago Park District, recommending that school children's victory gardens be provided in parks in 1943. The original recommendation was that wherever there was suitable soil and sufficiently sunny space, areas be laid out in the parks sufficient to provide garden plots

for over 30,000 children. The recommendation suggested that in parks of 100 acres or more a space not to exceed two acres be reserved for victory gardens; in parks 20 to 100 acres in size, at least one acre be reserved; in parks of 5 to 20 acres one-half acre be reserved; and in smaller parks a limited number of gardens be provided for, if possible.* The original report indicated that by keeping the size of the garden plot small and standardizing as much as possible, the following advantages would be attained:

(a) A large number of families will receive a direct impetus to become gardeners, especially as their young members bring home the products from their park gardens.
(b) Many thousands of school children will be attracted to the hobby of growing wholesome vegetables and beautiful flowers.
(c) The good will resulting from this project will have a lasting influence, and in years to come will assure an appreciation of the beauties of the parks on the part of future generations.

Those proposing this plan were fully appreciative of the fact that no group of grammar school children would show a sustained interest in a gardening project with its demands for hard work on hot summer days and its many other trials and tribulations, unless adult leaders gave stimulus to the program. It was therefore specifically provided that boys and girls would be assigned garden plots in a neighborhood park only in the event there were adult volunteers ready to work with them and see to it that interest was sustained.

Some of the most faithful and successful volunteer leaders were teachers in the public schools who gave freely of their time, not only during the spring planting season but clear through the hot summer months and until harvest brought joy to their charges.

Through the cooperation of Dr. William H. Johnson, Superintendent of Schools, a complete outline of the program was included in the *Principals' Bulletin* of February 2nd. This communication asked that each principal cooperate as follows:

(a) At an early teachers' meeting, discuss the attached plan for the victory garden project.
(b) Ask for one or more volunteers from among the teachers who will take charge of the project at their school. These teachers may also participate if they wish in working with the children in their garden plots, *although this is not required.*
(c) If the school is not located within a few blocks of one of the Chicago Park District parks in which victory garden plots are available, we would like to have the principal advise us if there appears to be any suitable nearby vacant lot that might be used for school children's gardens.

Out of Chicago's 334 grammar schools, hardly two score responses were received from this invitation. Naturally the public school teacher is loaded with many extra-curricular duties. He or she is drawn into almost every civic or patriotic movement, and is requested to interrupt her teaching program to a greater or less extent in order to serve these purposes. Under these circumstances it is natural that the average teacher would refrain from assuming any additional responsibility even for a worthy cause like victory gardens.

Citizen volunteers were also too few in number and reluctant to give the time throughout the summer that was necessary for complete success. Among those who came forward, however, including teachers in the grammar grades, were some who did an outstanding piece of work. The recruiting of these volunteers was chiefly due to the work of Mrs. Florence T. Klee, who contributed several months of her time to this work.

* George T. Donoghue, *General Superintendent of the Chicago Park District*, is also Director of Victory Gardens for the *Office of Civilian Defense*, Chicago Metropolitan Area. The writer is Assistant Director. So the cooperation of Victory Garden leaders in local neighborhoods throughout the City could be relied upon.

Without attempting to give credit to all who deserve it, mention should be made of Mrs. May C. Llewellyn, of the Wadsworth School, who led a group of some 400 odd children with their parents, all of whom had individual plots together in a single area in Jackson Park at the foot of 67th Street.

In practically all the parks where space was available for these victory gardens, the sod was either entirely removed and the ground plowed or rototilled, or the sod was thoroughly incorporated into the soil by plowing, rototilling or discing. *The Park District Engineering Staff* set off the outline of the individual beds by stakes driven along the outer edges of the plots. The adult leaders therefore needed only to extend cord from one stake to its corresponding stake on the opposite side of the plot. The children were then required to drive small sticks to mark off their own individual beds.

The beds were all five feet wide by twelve feet long, laid out as indicated in figure 1. Some impression of the layouts and general appearance of these beds is given in figure 2, showing the exhibition bed constructed in the lobby of the *Peoples Gas Light & Coke Company* building early in spring. Through the cooperation of Ernest Gries, a practical grower, and Division Chairman of Victory Gardens for Division 2, growing plants were provided in this exhibition garden bed. Parents and children could thus go to the Gas Building and see what they might expect in their victory garden if they followed instructions carefully.

The next problem which arose was that of providing seed. If each child were to buy a full packet it would have three or four times more seed than was needed for the five-foot rows in the standard bed. This was finally solved through the cooperation of *Marshall*

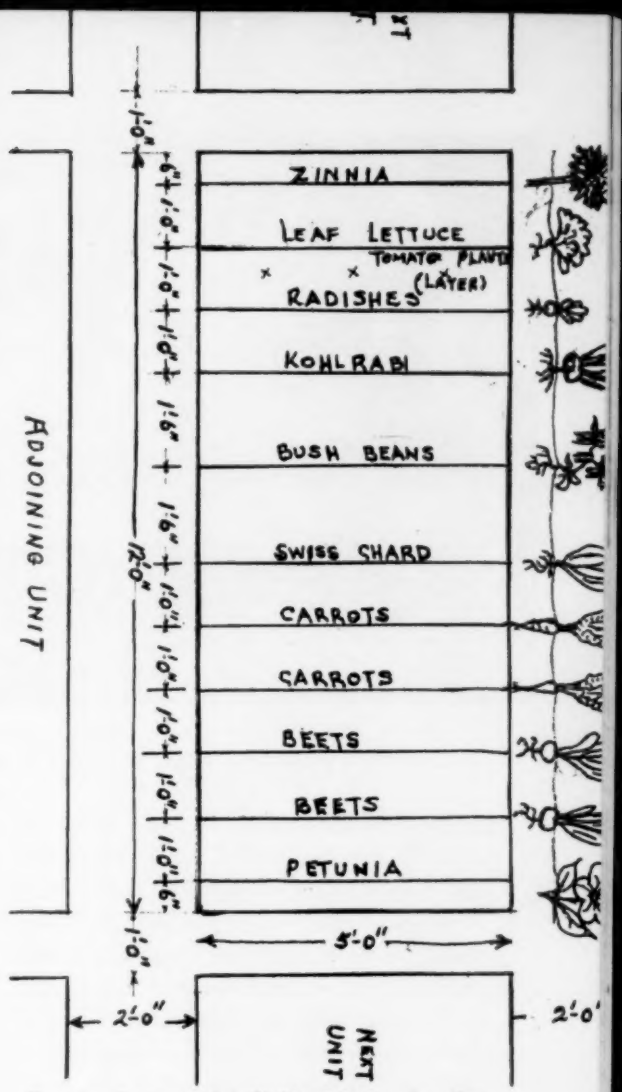


FIG. 1. Layout of individual beds; for the more successful plots, it was planned to have three tomato plants grown in the space left after the lettuce and radishes have been harvested.

Field & Company, who generously came forward and offered to provide all the seed necessary. Specifications were prepared for a standard packet, composed of a large envelope on which was printed the outline of the standard bed. In this large packet were included ten small envelopes, or seed packets. Each of these contained exactly enough seed for the five-foot row provided in the plan (or two five-foot rows of carrots and beets). In this way another lesson was accomplished, because each child was taught how far apart to space the seed. All that was necessary was to spread out the

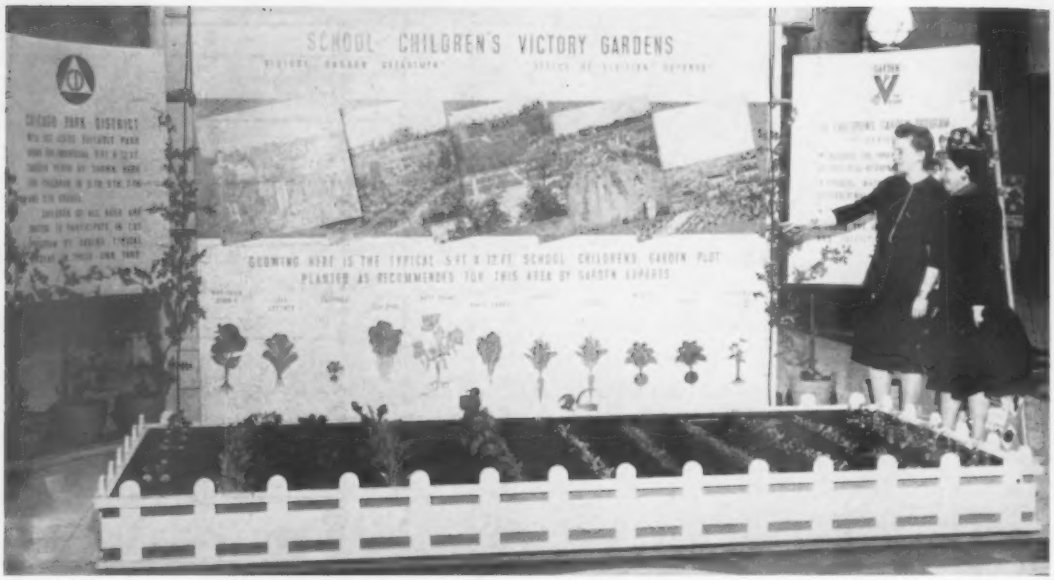


FIG. 2. Live model of school children's Victory Garden plot in the Chicago Park District, in lobby of Peoples Gas Light and Coke Company building. Chicago Park District Photo.

amount in the envelope evenly from one end of the five-foot row to the other. Anyone familiar with the chronic weakness on the part of beginning gardeners to plant their seed too close will realize that there was some value in this lesson.

Seed packets were provided for each child that was assigned a plot in the parks. Wherever public schools established their own projects on vacant lots and came to the Park District with a reasonable request, they were given seed sufficient for their purposes on the showing that they would plant the same standard plots as those established in the parks.

The growing season of 1943 was one of the most difficult and painful of any that Chicago has experienced in generations. An original schedule had been set up providing for distribution of literature and posters in the schools in the week of March 22nd; return of registration forms by children through their school or youth agency during the week of March 29th; assignments of garden plots to individual children during the week of April 5th; garden preparation including leveling, spading, raking and preparation of seed bed to be done during the week of April 19th; vegetable planting day to be Saturday, April 24th, throughout the city; flower planting day to be Saturday, May 1st, throughout the city.

Heavy rains, chill winds, and cloudy skies played havoc with this schedule. Muddy soil prevented planting in many areas until late in May. Heavy rains washed out some of the seed that was planted in other areas. Nature certainly frowned upon the whole project, but nevertheless, as stated at the opening of this article, over 14,000 children stuck to their job and were rewarded with good crops.

In all cases parents were invited to participate with their children, and in some cases the grownups were as interested and industrious in their care of the garden as were the young folks. In general, control of weeds and cultivation were carried out reasonably well. Petunias, if anything, were the most difficult because of their slow germination and the small size of the seed.

During the summer many of the gardens were inspected by such experienced figures as H. W. Hochbaum, Chief of the Division of Field Coordination, U. S. Department of Agriculture; Paul R. Young, Supervisor of School Gardening, Cleveland Board of Education; and D. W. O'Brien, Asst. Director Dept. of Manual Arts, Boston Public Schools. All these and other local gardeners who should know, were generous in their praise of the high average shown by most of our school children's gardens, not only in general appearance and control of weeds, but in careful planning, insect extermination, transplanting and thinning, and all the other garden operations that spell bumper crops. In fact, some of the garden plots showed remarkably good appearance, especially when the difficult conditions are considered.

At *River Park*, for instance, where the children were supervised by Frank Bruno, the beds were laid out with meticulous care and precision. Frequent inspections during the summer failed to show weeds in any of the beds or in the paths between the beds, although there were 152 children participating. Transplanting was carefully done; crops were thinned at the right time; the zinnias and some of the other plants that were thinned out of the regular beds were transplanted into one long decorative bed across the front of the project. Observers stated there could hardly have been a higher standard of culture. At Jackson Park, at Chase Park on the north side, at Columbus Park, and in a number of other instances, the supervision was so effective and the enthusiasm of the young gardeners so high, that bumper crops were harvested in almost every plot.

On the whole, Chicago's 14,000 novice school victory gardeners did a marvelous job. Credit belongs to those leaders in the recreation division of the Chicago Park District and those school teachers and private citizens who came forward and in spite of difficulties and obstacles, helped their young friends to learn what great joy comes from working in the soil.

FIG. 3. General view of 1943 garden plots in River Park. Photo by Frank Bruno.

Growing Live Plant Material for the Teaching of Biological Principles in the Biology Class

HENRY G. WENDLER
Supervisor of Gardening, Boston Public Schools

The need for live plant material to teach many of the important biological principles is important in nearly all communities, but most important in the larger communities where the children are city reared. Here, in many instances, the teacher has the same background and is content to use dried specimens, charts or diagrams instead of live fresh material in her teaching, especially the fundamentals. The children miss the all important factor of appreciation of many of our common plants and how important they are in our every day life. To some extent the biology teacher is responsible for this loss which is a real loss to city children especially. The question immediately arises then as to where this live material can be procured for classroom instruction. If your community supports a school garden program as part of the educational program, then seek the cooperation of the person in charge of that program or go directly to the school garden teacher. Space requirements are small and the children in the garden are usually very glad to participate in assisting to produce material for classroom study in the fall. Some specimens can be taken direct from any individual garden or from the flower border usually around the outside of the garden and cared for by everyone in the garden. Many of our common annuals excellent in the flower border are also superb for biology class study as will be shown later in this article.

If there is no school garden program in your community, then seek the assistance of your local park department. Most park systems have some greenhouses and a small amount of space in one would lend itself to the housing or growing of materials out of season. It is really amazing what can be produced for biology class study from ten square feet of bench space. If there is no school garden department in your community and the park department will not cooperate, then contact some local commercial grower or gardener; one with a greenhouse is preferred. The cost will be small and your problem of getting live material and so forth for class study is solved. Most commercial men are willing to cooperate where children and the public schools are involved, as they quickly go back to their own youth or perhaps they have children in school at the time.

Foot Notes to chart on opposite page:

1. Pollination and fertilization may be emphasized whenever flower structure is studied.
2. Nitrogen-fixation bacteria may be brought out in connection with the study of the bean. Alfalfa or wild sweet clover are also excellent for this study.
3. Any plants mentioned in the chart will grow well in any fair garden soil if fertilized well at the start and once or twice during the growing season.

The chart shows how live plant material may be procured right out of the garden until well into November. Before this date, plants like Swiss Chard, and Sweet William, may be lifted, replanted in suitable sized flower pots in enriched soil, and carried along in the laboratory for a considerable time.

MATERIALS WITH PLANTING DATES, USES IN THE BIOLOGY CLASS AND SIMPLE CULTURAL DIRECTIONS

Plant	Approximate date of planting (Vicinity of Boston)	Approximate date of using material	Subject matter to be taught	Brief cultural directions
Petunia	Plants: July 15 Seed: June 10–15	Sept. 7	Flower structure of dicotyledons	Plants 15″ apart each way, cultivate freely, grow in almost any soil. Keep slightly dry
"	" " "	Sept. 20–30	Hybridization (Purple×White)	" " " " "
Gladiolus	July 5–15	Sept. 10	Flower structure of a monocotyledon	Plant corms 4″–5″ deep, 6″ apart in rows 15″ apart, fertilize well, give ample water
Beans	Aug. 15–20	Sept. 15–20	Flower of a dicotyledon, nitrogen-fixing bacteria	Plant seed in rows 1″–2″ deep, 1″ apart in rows 18″ apart. Will grow in most soils
Beans	Aug. 1–5	" "	Fruit or seed study of dicotyldeon	Dust plants with rotenone for bean beetle
Cucumber or Squash (summer)	July 20–25	Sept. 10–30	Staminate and pistillate flower	Plant ¾″ deep, 8 seeds per hill, hills 4′×4′. Thin to 4 or 5 plants per hill. Dust with rotenone frequently
Corn (mature)	June 25–30	Oct. 1	Brace roots, corn smut, corn borer, pollination, staminate and pistillate flowers	Plant in rows, 30″ apart, hills 24″ apart, 4 or 5 seeds per hill, cultivate freely. During summer cultivate shallow
" (tasseling)	July 17–22	" "		
" (young)	Aug. 10–15	" "	Stem structure of monocotyledons	For stem study may also plant 4 seeds in 6″ flower pot. Bring inside when frost comes
Cosmos or Calendula	July 15–20	Oct. 1–15	Composite flower study, stem study of dicotyledon	Plant seed in rows ½″ deep, 18″ apart. Thin plants to 4″–6″ apart. Keep weeded and remove dead flowers as they appear
Nasturtium	July 15–20	Collect and preserve leaves in liquid for winter use before frost	Presence of starch in leaves, necessity of light for starch manufacture	Plant seed in rows 15″ apart, 1½″ between seed. Provide ample water. Dust black aphids with rotenone.
Helianthus (dwarf sunflower) or Zinnia	July 1–10	Oct. 10–25	Composite flower structure	Plant seed ½″ deep, rows 24″ apart. Thin plants to 6″–8″ apart—very easy to grow
Swiss Chard	July 1–10	Oct. 15–31	Photosynthesis, release of oxygen	Plant seed ¾″ deep, 1″ apart, rows 18″ apart. Thin plants to 6″–8″ apart when 4″ high. Pot a few plants in fall
Sweet William	July 1–10	Nov. or early Dec.	Upper and lower epidermis of leaf and internal leaf structure	Plant seed ½″ deep, rows 12″ apart. Thin to 2″ apart—easy to grow
Tomato and Beet	June 1–20	Oct. 15	Root systems, spreading and tap	Secure plants from any vegetable garden or grow according to usual directions

THIS GARDEN ISSUE

A next door neighbor this New Years Day 1944 just said: "Lichtenwalter, we are having one of the largest meetings of food salesmen Monday that we have ever had. Something big is going to break. I don't know just what it is but it will be important. With millions being added to our national dinner table there are going to be more shortages. We still, more than ever, need your food gardens." I have a great deal of respect for my friend and neighbor's knowledge of our food problem. He has a clear factual concept of the world food problem because of his position.

This garden issue has stressed what the biology teacher might do both as a teacher of biology students and as a community leader, at a time and place where his talents may be of great and lasting good to the public. The writer has, as an example, a credit of fifteen hundred hours of victory garden work in the Chicago OCD office as of September 1943. He supervises the work of two communities. In one of these communities he has reported the largest number of gardens of any community in the city, a total of 1894 gardens. He is positive there are hundreds of other biology teachers with similar or better records. He knows this as do the writers of many of the articles of this issue.

You no doubt have similar activities along some line of the war effort. We must keep up the good work. We are the leaders and because of the inherent nature of our work must remain leaders. This is the golden opportunity for biology teachers to aid other educators in maintaining leadership, both during the war and in the subsequent peace. Garden effort is one phase of this.

M. C. Lichtenwalter,
Guest Editor

FROM THE SECRETARY

Mrs. Ida DeWitt Hall, of Wilkes-Barre, Pennsylvania, has done one of those little courtesy acts that make a secretary's life endurable. A charter member of the National American Biology Teacher, Mrs. Hall wrote that she does not wish to continue membership because she is leaving the profession. Then she offered to send me her complete file of the *American Biology Teacher*.

I am not suggesting that others do likewise, but here is an idea: Among our charter members there must be some who have extra copies of certain issues of *Volume I* (no longer available), while there are others who lack one or more numbers to complete their files. If you have a second copy of any number of the first volume, why not send it to me? At the same time, if you tell me which number or numbers you lack I shall make a note of it and send it (or them) to you if and when they come in. Dr. C. M. Farmer of Troy, Alabama, for example, has already sent a spare copy of Volume I, #6, but he needs numbers 2 and 3 of Volume I. I could furnish him with everything else needed. The secretary will be glad to serve as a medium for such exchanges.

G. W. Jeffers,
Secretary-Treasurer,
Farmville, Virginia

THE PENNSYLVANIA JUNIOR ACADEMY OF SCIENCE

Plans are being made by Miss Mary Hawthorne, director of the *Pennsylvania Junior Academy of Science*, for the Annual Meeting to be held at York, Pa. on Friday afternoon and evening and Saturday morning, April 7 and 8. Mr. Edwin T. Moul, sponsor of the William Penn Junior Academy of Science, is in charge of local arrangements, and Charles W. Rutschky is in charge of exhibits. Pennsylvania high school science clubs are invited to enroll now for membership in the Junior Academy so that they may send representatives to the York meeting. The York program will consist of demonstrations and lectures of scientific studies made by high school science club members thruout the year in participation of their home club activities. Exhibits are also a part of the convention. Miss Sophie Moiles, Central High School, Johnstown, Pa., will organize the program for the meeting. To enroll in the Pennsylvania Junior Academy of Science send $1.00 dues to the secretary, Miss Marie Knauz, Peabody High School, Margaretta St., Pittsburgh 6, Pa.

A LETTER FROM WASHINGTON

DEAR MR. LICHTENWALTER:

During the past three seasons student labor contributed materially to the production and harvesting of crops vital to the war effort. In many areas their efforts were directly responsible for salvaging essential crops which otherwise may have remained unharvested.

The initiative your organization is taking to stimulate student interest in crop production, and to direct those interests in channels where they will be most productive, is commendable. Undoubtedly the 1944 crop production program will afford an opportunity for continued and increased student labor participation.

Maximum utilization of the services of all available labor will require close coordination of the efforts of government and private agencies, organizations, and other parties concerned with, and interested in our food production program.

Sincerely yours,

PAUL V. MCNUTT,
Federal Security Administrator

NOTES

Miss Marie Knauz has accepted until April the directorship of the *Pennsylvania Junior Academy of Science,* replacing Miss Mary Hawthorne, who has enlisted in the WAVES. . . . Several more articles on gardens are on the editor's desk; some of them are excellent, but had to be omitted from this issue because of lack of space or because they arrived too late. They will appear in early issues. . . . Several of the manuscripts submitted recently have been accompanied by exceptionally good photographs. . . . Anything intended for the May Issue should be in the editor's hands early in March.

CORRECTION

In the list of recommended books for bird study, in the Ornithology Issue, (Jan. 1944, 9. 92) the book listed as: SAUNDERS, A., *A Guide to the Birds,* should be: *A Guide to Bird Songs.*

A Message from the United States Department of Agriculture

I am sure that every teacher of biology understands the need for greater production of food in 1944. For the last seven years we have broken records in food production and we must do it again this year.

Perhaps you do not realize what an important part you can play by working on a farm this summer or growing a victory garden. Possibly you have read that the estimated yield from victory gardens last year was 8 million tons, but do you realize that this is more than 40 per cent of all the vegetables grown in the United States, exclusive of those grown under contract for canners?

Last year we grew 20 million gardens and harvested 8 million tons of food. This year we are asking for 22 million gardens and 10 million tons. We know that many gardens will be larger this year, and we believe they will be better planned and cared for. That is why we are expecting an increase of 25 per cent in production with an increase of only 10 per cent in numbers.

For the year 1943 nearly one-fourth of all our food went to our armed forces, our allies, and relief of liberated peoples. This year these needs will be larger—just how much no one knows, but we must be prepared to meet them, however great.

To keep our people at home well fed and to meet these other needs for food will require the efforts of every one of us. Those who can grow a successful garden will find this a pleasant way to do their share in the battle of food. Others can do their part on a farm for the summer. Our farmers are putting every ounce of their energy into food production this year. We must do everything we can to help them.

KEITH HIMEBAUGH,
Acting Director of Information
U. S. Department of Agriculture

Science Includes Gardening in the Cleveland Schools

PAUL R. YOUNG
School Garden Supervisor, Board of Education, Cleveland, Ohio*

For a good many years Cleveland has been working to develop a sound and effective school gardening program. This effort has been based on a belief in the value of such a program as a means of educating boys and girls. Even though the war has given added importance to the tangible products of our gardening, we are not forgetting that the youngsters are the ultimate objective of it all, and we are still planning our program for their benefit, as a part of their regular school work.

An activity as valuable as this merits inclusion somewhere in the regular curriculum. It seems to me to be, unmistakably, a phase of science. As a laboratory for science the garden has tremendous resources, and even isolated gardening experiences that can be taken into the school, are of great value. The garden is more than a laboratory in the school sense of the term, for its situations, experiments, reactions and results are not artificial, but real. Gardening may be a most valuable means of tying scientific principles to practical life realities and thus make them meaningful to the pupils.

Educationally successful gardening must also be horticulturally successful in the long run. The war-time emphasis on the crop of course adds further importance to the horticultural soundness of the enterprise. This means systematic subject-matter instruction, which science teachers are best equipped to give.

A planting line serves a whole row of plots in the school garden tract, where the plot plan is uniform for all. Cleveland School Garden Photo.

Only by making the gardening an integral part of science instruction are their services in this capacity insured.

It is in the careful organization of the practical gardening work of pupils, that the services of regular teachers become even more important, if possible. School garden tracts must be carefully planned and administered from an educational point of view to achieve their proper objectives. This means teacher management. Home garden projects left to parental convenience and whim, or to the volunteer leadership of outside agencies such as adult garden clubs, are bound to be only intermittently successful—when circumstances provide wise and thoughtful parents or an interested and capable adult leader. *Consistent success* demands school-planned and school-supervised projects, in charge of teachers whose paid services include this work.

* President, Garden Education Department, *National Education Association.*

We now come to the practical part of the discussion—*How* can gardening or Victory Gardening, be made a part of the curriculum?

The simplest means is through the teaching of lesson units in science, adapted to the limitations of the classroom. Science in the elementary grades is properly an interpretation of the child's environment in terms he can understand. Plant and animal life are key portions of that environment and many expressions of them can be brought into the classroom without loss of setting or of reality.

Gardening taught as an integral part of science in this manner is both logical and practical. It helps to tie all the science to reality as the child sees it, and in so doing it makes easier the job of the science teacher. It calls upon the teacher for little that suitable science preparation plus practical gardening experience does not provide. It involves no burdensome expense and no difficult adjustments of program to make way for a new subject. It brings gardening contacts, even though limited, to all pupils.

With this classroom garden-science as a basis, actual gardening appeals to the pupils. We have found this to be true all through the development of our home project program, and now the stimulus of Victory Gardening, of course, adds to the interest in practical gardening. If appropriate garden specifications, supplies and supervision for such efforts are provided by the school, they become of greatly increased value both from the standpoint of education and production.

Whether the pupils do their gardening at home or in school-sponsored tracts will depend upon local circumstances. Both methods are in use in Cleveland with eminent success. From the standpoint of expense, problems involved, number of pupils who can be served, and general

Gardens interest elementary boys and girls alike; Roland Campbell works in his school-home garden while his friends look on in approval. All are pupils in Gordon Elementary School, Cleveland; Miss Carrie M. Buettner, Principal. Cleveland School Garden Photo.

feasibility under average school conditions, I feel quite definitely that the home project program is to be preferred. This is especially true for the initial year or so.

The primary considerations in such a school-home project program are (1) definitely specified garden plans with provision for furnishing the needed seeds and plants to the children enrolled, (2) adequate instruction, and (3) some home supervision.

Children do not know how to plan a suitable garden for their own capabilities, nor do their parents, as a rule. Consequently, when home projects are left to the individual to plan, more frequently than not they are unsuitable in size and planting, and result in failure. Again, when the providing of seeds and plants is an individual matter, their availability is so indefinite that any systematic procedure of planting according to season and weather is almost impossible. Many children who enroll under such conditions never do get their garden started because of inability to get the needed supplies.

Our experience leads us to conclude that a really successful home garden project program requires *specified gar-*

den plans for the youngsters to follow and the furnishing of needed supplies, for a minimum fee, to those who enroll. When this is done the project becomes definite both for children and parents. The garden crops can be chosen with an eye to ease of culture and probability of satisfactory production, as well as with reference to nutritional needs, variety of educational experiences, and the cost of seeds and plants. Garden size will be a balance between various limiting factors such as space available in the average home yard, amount of work a youngster can do without its becoming irksome, and the cost of necessary supplies.

With uniform gardens, class instruction may be given. Supplies may be bought wholesale and apportioned for the individual pupils enrolled. Specific directions and dates are applicable. Everyone knows just what is expected and, with the school-furnished supplies, is ready to do the necessary work at the proper time. Parents recognize the identity of the "school garden" and are interested. Teachers know what to look for when visiting the home gardens. Costs to the children are kept at a minimum, and quality materials can be assured.

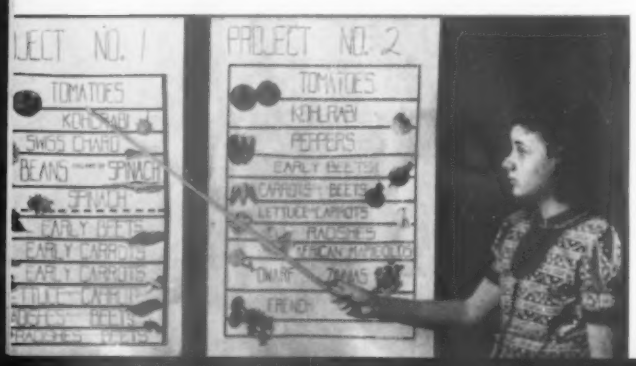
In Cleveland, pupils who wish to enroll choose one of the specific plans offered, and pay an enrollment fee which is used to purchase the seeds, plants and fertilizer they need. These supplies are delivered to the schools at the proper time, for distribution to those enrolled. In 1943, 13,500 pupils enrolled for home project gardens and 1500 more for gardens on school-operated tracts.

Planting the garden at home according to plan takes careful measuring, but a lesson on this in school gets across the idea. Cleveland School Garden Photo.

The second of my primary considerations was *adequate instruction*. This is fairly simple when all children are conducting similar projects. In Cleveland we include it in the science program, as definite units in grades IV through IX. Lesson material which we have found to be practical, teachable, and effective is available in inexpensive text form in ELEMENTARY GARDEN-GRAPHS and its accompanying TEACHER'S MANUAL.* This series of lessons covers the fundamentals of gardening which pupils must have in order to grow a garden reasonably well. All pupils get the instruction, even though they are not enrolled for gardens.

The third primary consideration is *home supervision*. Lack of it is a rock upon which many home garden project programs have been wrecked. A certain amount of it is essential, but it can become unduly expensive unless limited.

* Published by Garden Reviews, Inc., 415 Lexington Ave., New York 17, New York.



One teacher's way of making graphic the specified home garden project plans. Cleveland School Garden Photo.

We have found that a program of two home visits during the summer is satisfactory, and strikes a reasonable balance between cost and what might be educationally desirable.

If at all possible, the regular school-year teacher should do the home visiting, with pay on a per diem basis, or per visit. This eliminates lost motion in getting acquainted, and almost insures an educationally effective visit.

In Cleveland we employ each summer about 100 of the science teachers for this home visiting of their own pupils who have enrolled for garden projects. Pay is $5.00 per day of 24 visits, which low rate insures that only teachers really interested do the work. It is not required of science teachers, but most of them want to do it and follow through on the home phases of the work they start in school. The time required depends upon the number of pupils enrolled, but is only a few days at most, and seldom interferes with other summer plans.

This plan of supervision has proven eminently satisfactory. Parents, teachers, and pupils all enjoy the home contacts. Principals recognize it as a potent builder of good will for the school. Its cost is reasonable (about 36 cents per pupil in Cleveland in 1943), and it seems to be sufficient to maintain pupil interest and satisfactory standards of achievement.

Cleveland has definitely made gardening a part of its science program in elementary and junior high schools, with recognized benefits to pupils, parents and teachers. We stand ready to share our experience with any who are interested in something similar.

An Elementary School Garden Project

LYDIA ELZEY
Fitzgerald School, Detroit, Michigan

During the spring and summer of 1943, Victory Gardening, next to the war, was perhaps the most universally discussed topic. Since nearly every household, whether urban or suburban, turned to gardening as a means of extending those precious ration points, a source of gardening information was necessary. Of course, garden centers, garden courses, and garden literature were available but what could be a more appropriate place than our school science rooms for giving scientific gardening instruction?

A practical garden unit not only prepares children to share the responsibilities of a war-torn world but is a concrete correlation between the book lessons learned in the classroom and everyday life. Through practical experiences they can actually see the energy of sunlight at work, realize the importance of water to living things and watch the mystery of life unfold from a tiny seed.

At Fitzgerald School we began our garden work under unusually favorable circumstances last spring. Gardening was not entirely new to these youngsters

as a formal school flower garden has been maintained for several years and also a wild-flower garden. This year a plot $21' \times 21'$ was set aside as a vegetable garden. The school is equipped with a conservatory in which to start seedlings and carry out demonstrations and experiments. A large glassed hall case is available for displays. We are also fortunate in having children eager to learn and parents and teachers willing to cooperate.

The work was undertaken by grades four through eight. Some phases of the work were review to some of the older groups. Interest was maintained throughout, however, because of the variety of activities.

The garden unit began early in March. To stimulate interest a display of garden tools, seed packets, colorful catalogues and pictures were arranged in the hall case. A collection of attractive garden books was arranged in the school library as well as in the science room. Each child prepared a handbook with a decorative cover and pages to be filled in as the garden work progressed.

A discussion of garden tools was our first consideration. Spade, rake, hoe, and trowel were considered the "musts." Other tools could be used to good advantage if accessible. Criteria for selecting the most serviceable implements were established for those who found it necessary to purchase new ones. Proper care and storage of these valuable materials were also discussed.

Soil received much attention. Samples of sand, clay, humus, and garden loam were brought into the science room. A demonstration showing the water- and air-holding capacity of each was arranged. This was done by fastening cheesecloth over the bottom of lantern chimneys and filling each with the respective soils. Each one was placed over a glass jar. The same amount of water was poured into each container. Later, the jars were examined and the amount of water noted. The soil was examined for dryness. The children easily drew their own conclusions as to the soil which held the most water and the one which held most air spaces. They also observed that the loam had some of the characteristics of each of the other three. Another experiment was arranged in a special container with glass sides and wooden frame divided into four compartments. The four types of soil were placed in the case and bean seeds planted near the glass. The amount of water provided was the same for each compartment. Growth, especially of the roots, was watched carefully. A discussion of the nutrient content of each soil followed. The pupils readily discovered that the porous quality of sand, the water-holding ability and food value of both clay and humus made loam the best soil for general garden use. This led to ways of conserving soil nutrients. A compost pile was discussed and one was planned for the school garden. The proper use and application of fertilizers received attention.

Choosing the garden plot was our next consideration. The plots were chosen according to the amount of sunshine received as well as the quality of soil. Areas were timed for sunshine hours. Those receiving less than five hours daily were considered unsatisfactory. In many cases where back yard lawns were to be converted into garden spaces parents were willing to trim or remove shrubs and trees to permit adequate sunlight. Experiments showing the value of sunlight were set up by eight flower pots containing tomato plants. Two were exposed to direct sunlight for *five hours* daily, two had *three hours* of sunlight, two *one hour* and two were kept

out of direct light. All conditions except light were kept constant. Progress of these plants was noted over a period of two weeks. Conclusions were easily drawn as to the role sunlight plays in the life of growing plants by observing and comparing the larger leaves and sturdier plants with small leaved spindling ones. It was also suggested at this point that garden rows be planned to take the best advantage of sunshine. A flat containing rows of small plants was placed in the sun with the rows running north and south. Another one was arranged with the rows east and west. By observing the shadows cast by the plants at various intervals during the day the children saw the value of rows in the north-south direction.

In April, flats of sifted soil were prepared in the conservatory. Three varieties of tomato seeds especially recommended for the Detroit area were planted in the flats. Each child had the experience of planting and caring for the tomato plants. When the seedlings were about three inches tall they were transplanted into small clay pots. When the supply of pots was exhausted, ice-cream cups were salvaged from the school lunchroom for that purpose. Holes were punched in the bottom and a layer of charcoal or flower-pot chips furnished sufficient drainage. The children took great pride in their transplanting skill. There were very few casualties in comparison with the twelve hundred healthy plants that were later to be placed in home garden plots.

As soon as the soil out-of-doors was dry enough, a trip was made to the school garden. By handling the soil the children were able to determine whether it was dry enough to be worked. In preparing the soil the children learned how to handle tools and how to cultivate the ground for planting.

The problem of keeping forty-five or more pupils profitably occupied with a limited supply of tools was presented. It was solved, however, by dividing classes into groups of eight or ten. While one group prepared the garden soil others dug dandelions from the lawn, cultivated the perennials, dug lilac suckers, weeded or worked in the wild-flower garden. By rotating, each group had its turn in preparing the soil. A compost pile was established where weeds, leaves, and rakings were deposited. Plans were made to work the decayed material from the compost pile into the soil in the fall spading.

On days of inclement weather work continued indoors. A large chart was made on which each garden vegetable was listed, along with the date when it should be planted in our locality and directions for planting. The children recorded this information for the vegetables they desired. With the aid of the *State Agricultural College* bulletins, the varieties best suited to this locality were recommended. The children were encouraged to purchase their seeds early but were urged to buy only enough for their needs.

Measurements for home gardens were brought to the classroom and plans of them were drawn to scale. Compass points were also indicated. The apartment dwellers planned the school garden.

When all plans were completed, planting began according to schedule in the school garden with each child participating. Conservation of seeds in sowing, care in covering them, and labeling of rows were points emphasized. Tomato plants from the conservatory were transplanted in the school garden.

Then the work in home gardens began. As the work progressed home problems were brought to the science room. Solutions were reached by discussion or ref-

erence to the many garden bulletins and books available in the library and science room.

The common garden insects, their life histories and the methods of controlling them were discussed. Cultivation as a means of controlling weeds, and through them insects, was demonstrated in the small garden laboratory.

With the close of school in June home gardens were well under way. They were cared for during the summer. In the fall methods of preserving and storing products for winter use were considered. The garden work culminated in an exhibit of fresh and canned vegetables in the school hall. All specimens in the exhibit were raised by the children. The parents cooperated with the children in the canning process.

In the garden work at Fitzgerald School there was developed a splendid feeling of cooperation between the work of the children at school and the work of parents and children in the back-yard garden.

POINTERS BY SEASONS

I. Fall

1. Select the garden site in the fall, especially if the ground is new.
   a. An open, sunny location is best.
   b. Good drainage is very important.
   c. Avoid areas close to trees or shrubs.
2. Have soil tested.
   a. Send soil sample to County Agricultural Extension Office or your own State Experimental Station.
   b. Keep in mind the results of the soil test when treating it.
3. Plow or spade the soil if not too hilly, and especially, if covered with sod or composed of clay.
   a. Apply a layer of barnyard manure at the rate of 1000 pounds to every 1000 square feet of garden, *i.e.*, poor soil.
   b. Or plant rye or winter wheat in late August or early September and turn under in the early spring just before planting time; 3 pounds of seed to 1000 square feet of garden.
   c. Sifted coal ashes may be mixed with the soil to improve drainage.

II. Winter

1. Send for a seed catalogue.
2. Draw a garden plan.
   a. Wall charts are issued by many County Agricultural Extension Offices.
   b. Avoid planting of large soil area demands, such as corn, squash, cukes, etc., in small plots.
3. In late winter start the seeds of tender plants in flats.
4. Get tools in shape—hoe, rake, and spading fork are necessary.

III. Spring

1. Soil treatment—important. Have it tested if not done in the fall.
2. Correct soil as suggested by the results of the test. Neutralize an acid soil by applying lime after plowing followed immediately by harrowing, or after spading followed by raking. Apply at the rate of 50 pounds per 1000 square feet every two or three years.
3. Spring plowing or spading of at least one third of the plot should be done by April 15 (Pittsburgh, Pa., vicinity).
4. Harrow or rake only when the ground is dry enough. Note—the soil should crumble when gently pressed in the hand.
5. Scatter fertilizer before planting seeds. Be sure to apply at the rate given with the directions for using.
   a. Victory Garden Fertilizers (3–8–7) contain 3% nitrogen, 8% phosphorus, and 7% potash.
   b. Remember:
      "The nitrogen girls are tall.
      The potash twins are active.
      The phosphorus boys are robust."
6. Consult Planting Chart, referred to above, for early mid-season, and late planting guide. (These dates for Pittsburgh area.)

a. April 15. Plant seeds of peas, radishes, lettuce, spinach, beets, carrots, and onion sets. Set out early cabbage.
b. May 15—snap beans, endive, chard, and corn.
c. June 1—snap, pole, bush beans, and tomato plants.
d. June 15—late cabbage, turnips, late beets, and carrots.
e. Do not plant seeds of one kind all at once. Plant bush beans, for example, every two weeks.

IV. Summer

1. Apply a top dressing of fertilizer as necessary.
   a. Study the requirements of each kind of plant.
   b. Mix fertilizer thoroughly with the soil about 3 or 4 inches from the stem, and water well.
2. Cultivate after every rain to conserve moisture.
   a. Very shallow—1″ or less.
3. Keep weeds down.
4. Destroy insects. Rotenone is a good general dusting medium against aphids and chewing insects.
   a. Squeeze the tips of the corn ears to kill the corn ear worm or other larvae which might be present.
   b. Remove and burn parts infested with smut.

Marie Knauz,
Peabody High School,
Pittsburgh, Pennsylvania

ATTENTION HIGH SCHOOL BIOLOGY TEACHERS

The unit in my biology course which is stressed the most is student projects. Each student selects a subject which, first, he is most interested in, second, which may lead to a hobby, and third, which may help him in his future life's work.

On May 29, 1944, approximately 130 students will present an exhibit of their projects before the public. It is called *Biology Project Night* and is sponsored by my very active Biology Club. Last year we had about 1500 people at our exhibit, which is held in the school gymnasium.

This year, student Kenneth Ramsay has selected as his project: "Exchanging Specimens with Biology Teachers throughout the United States."

I would greatly appreciate it if you would give Kenneth your attention, should he write to you concerning an exchange. He is very much interested in the biological sciences and has a fine collection of specimens which he would like to exchange, especially marine specimens.

Sincerely,

Irving C. Keene,
Watertown High School,
Watertown, Massachusetts

NOTE TO OFFICERS OF STATE AND LOCAL ORGANIZATIONS

At the meeting of the Representative Assembly in Chicago, Mr. Prevo L. Whitaker was selected to head a committee for the purpose of stimulating relationships among the NABT and affiliated organizations and among these organizations themselves.

Notices and reports of local meetings should be sent as promptly as possible to Mr. Whitaker, University High School, Bloomington, Indiana. Also, records of organization, names of past officers, etc., will be appreciated. It is hoped that we may develop a central record of each local affiliated organization and that we may be helpful in coordinating activities and policies of the various locals, also in strengthening the bonds of the national association and the locals.

BY THE WAY

For Coating Glass so that it will take ink, make a dilute solution of gelatin in hot water, adding a bit of sodium benzoate or a drop of carbolic acid (phenol) for preservative. When the surface is dry you can write on it with India ink or any of the waterproof inks. Water colors do not take so well. Lantern slides may be made in this way. The ends of microscope slides can be dipped into the coating solution and the labels written directly on the coating.

For Successful Aquarium plants and animals, do your collecting in quiet pools and ponds, and not in running water. The organisms that live in running water cannot as a rule make the adjustments necessary to live successfully in the still warm water of an aquarium. This is especially true in the early spring when the temperature of the natural waters is far below that of the aquarium.

ELECTION NOTICE

(The nominating committee appointed at the meeting of The Representative Assembly, in Chicago on November 27, 1943, has submitted the following list of nominees for offices of The National Association of Biology Teachers for the year 1944–1945.)

For President-elect:

MR. PREVO L. WHITAKER, teacher Univ. H. S. Bloomington, Ind., previously at Vigo Co. Sch. 7 yrs., A.B. Ind. State Teachers College plus 1 yr. special work, now working on M.A.; member: Ind. Acad. Sci., Am. Council Sci. Teachers; Counselor Ind. Jr. Acad. Sci., member N.A.B.T. and local affiliates relations comm.; major scientific interests: biology teaching in H.S., correlation of science through elem. and H.S. levels. Has worked with two groups on the latter problem.

MR. LEE R. YOTHERS, biology instructor and head of Science Dept., Rahway H.S., Rahway, N. J., B.S. Univ. Pittsburgh, M.A. Teachers College, Columbia Univ.; member: Am. Council Sci. Teachers; N. J. Sci. Teachers Assoc.; Assoc. Editor and contributor *Am. Biol. Teacher;* author of articles in other scientific journals, chairman field trips issue *Am. Biol. Teacher;* membership representative for N.A.B.T. in N. J.; served two yrs. on exec. comm. N. J. Sci. Teachers Ass'n, present Biol. Sec. Chmn., past ed. of bulletin, Chmn. pub. comm.

For First Vice President:

MR. PHILIP E. FOSS, teacher Hartford Public H.S., Hartford, Conn., classroom public school teacher of Biol. 16 yrs., formerly instructor in Zool. Mass. State College; B.S. Bowdoin College; A.M. Bates College; summer courses L. I. Biol. Assoc.; member A.A.A.S.; co-author secondary sch. text *Social Biology;* Assoc. Ed. *Am. Biol. Teacher* and chmn. biology clubs comm.; especially interested in Nature counseling in summer camps.

MISS MARIE KNAUZ, teacher biol. (formerly botany and zool.) Peabody H.S., Pittsburgh, Pa., 15 yrs.; Supervisor Nat. Study and Sch. gardens, Pittsburgh Pub. Sch. 3 yrs.; B.S. and M.A. Univ. Pittsburgh; summer sessions: Cornell, 3; Columbia, 1; Pa. State, 3; Cold Spring Harbor, 1; member: Am. Coun. Sci. Teachers, Am. Sci. Teachers Assoc., Am. Nat. Study Soc., Am. Mycological Soc., Phi. Sigma, Nature Club, Pittsburgh, Pa. Acad. Sci., Biol. Teachers Club S.W. Pa., Botanical Soc. W. Pa., Audubon Soc. W. Pa.; chairman membership comm. N.A.B.T.; past Pres. Biol. T. Club S.W. Pa.; Secy.-Treas. Central Sci. Comm., Pittsburgh; Secy. Pa. Jr. Acad. Sci.; chmn. program comm. Bot. Soc.; and of conserv. comm. Audubon Soc. Pa.; member: Sci. Fair comm. at Buhl Planetarium; local arran. comm. Am. Coun. Sci. T. Conv. July, 1944; Major sci. interests: Gen. Biol. and Field Nat. Hist., espec. Bot., Mycol. and Ornithol.

For Second Vice President:

MISS BETTY LOCKWOOD, Biol. Teacher, Redford H.S., Detroit, Mich.; B.S. Wayne Univ., M.A. Cornell Univ., grad. work Univ. Chicago; member: Detroit Biol. Club, Metropolitan Detroit Sci. Club, Audubon Assoc., Am. Council Sci. Teachers, Am. Forestry Assoc., Cent. Assoc. Sci. and Math.; mem. comm. on Visual Educ. Am. Coun. Educ., chmn. Biol. Conference Mich. Schoolmaster's, chmn. Detroit Reg. Meet. N.A.B.T. 19b2, delegate Detroit N.A.B.T. meet. Dallas, 1941, Chicago, 1943; guest editor *Am. Biol. Teacher* ornithology issue. Special scientific interest: conservation.

MR. ZACHARIAH SUBARSKY, Chairman Dept. Biol. and Gen. Sci., Bronx H.S. of Sci., N. Y. City, 5 yrs., 15 yrs. sci. teaching; B.S. Coll. City of N. Y., M.S. Columbia Univ., attended Cornell Univ.; member: A.A.A.S., Natl. Sci. Teachers Assoc., Fed. of Sci. Teachers Assoc. N.Y.C., N.Y.C. Biol. Teachers Assoc.; representative of Natl. Assoc. Sc. Teach. on comm. working with War Dept. on preinduction educ. in Sci.; Major scientific interests: bacteriology, biochemistry, nat. hist.

For Secretary-Treasurer:

MR. M. A. RUSSELL, Pres. N.A.B.T.

NEW CATALOG-DIRECTORY

A new type catalog-directory classifying a wide range of visual training aids for teachers and schools is announced by The Jam Handy Organization, 2900 E. Grand Blvd., Detroit 11, Mich., and a copy will be sent free upon request. By a system of indexing and cross-indexing, the teacher is enabled to quickly locate the subject wanted by a mere flip of the page. "Previews" of each film are given in the form of illustrations reproduced directly from the films themselves. Another feature shows the best types of projectors for various visual educational purposes.

PHOTOGRAPHY ISSUE

The special issue on photography in biology teaching, under consideration for a long time, is now in process, with Associate Editor Richard F. Trump, Ames Senior High School, Ames, Iowa, as guest editor. He will be assisted by Mr. Ralph Rood, Lakewood High School, Lakewood, Ohio, and others. If you would like to help with this issue, or if you know of anyone who could make a worthy contribution, get in touch with Mr. Trump as soon as possible. We hope to have this issue ready for the first or second number of Volume 7, i.e. October or November 1944.

A Spencer Microscope being used aboard a United States heavy cruiser.

Microscopes go into Battle, too

Every warship has its hospital—not only to treat battle casualties but to care for illnesses and accidents.

An indispensable item of equipment of course, is the microscope—used in clinical work, making blood counts, aiding in diagnosis, serving many laboratory needs.

Spencer provides these and many other optical instruments for the U. S. Navy—including battleship turret gunsights, aircraft and anti-aircraft gunsights, turret periscopes, prism binoculars, field glasses and telescopic alidades for navigation.

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